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Atomic Power---Mankind's Boon or Destruction?

Moderator, GUNNAR BACK

Speakers

RALPH LAPP

PAUL AEBERSOLD

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COMING

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The account of the meeting reported in this Bulletin was transcribed from recordings made of the actual broadcast and represents the exact content of the meeting as nearly as such mechanism permits. The publishers and printer are not responsible for the statements of the speakers or the points of views presented.

THE SPEAKERS' COLUMN

DR. RALPH E. LAPP—Director of Nuclear Science Service, former Executive Director of the Research and Development Board, author of *Must We Hide?* (1949), and *The New Force* (1953). An outstanding authority on the science and technology of the atom, Dr. Lapp received his S. B. and Ph. D. degrees in Physics at the University of Chicago. Starting his professional career under the noted Dr. Arthur H. Compton at the University of Chicago, where he did research in cosmic radiation and nuclear structure, he then worked on the wartime project of the A-bomb, and served as Asst. Director of the Chicago laboratory of the Manhattan project, 1943-45. From 1945 to 1946 he acted as Asst. Director of the Argonne National Laboratory. In 1946, he participated in the Bikini Bomb Tests as Scientist Consultant on Radiation, and during 1946-47 was associated with George Washington University and the War Dept. General Staff as consultant on atomic energy. The following year he served as Deputy Director of Atomic Energy, Joint Research and Development Board. During 1949, Dr. Lapp served as head of Nuclear Physics, Office of Naval Research, and in 1950 he was appointed Director of the Nuclear Science Service. Dr. Lapp is well known for his books and articles on atomic energy. He has written the first military text on atomic energy, and foreseeing the current emergency in civil defense also wrote *Must We Hide?*, the first American book on atomic defense. Dr. Lapp's articles have appeared in leading national magazines. Author of *Must We Hide* which was published in 1949, Dr. Lapp is also author of *The New Force* (1953).

DR. PAUL E. AEBERSOLD—Director of Isotopes Division, United States Atomic Energy Commission. Dr. Paul C. Aebersold received his doctorate in 1938 from the University of California at Berkeley. From 1932 to 1942 he did research in nuclear physics, biophysics and cancer. From 1942 to 1945 he was a special administrative aide to Dr. E. O. Lawrence, inventor of the cyclotton, in drawing up plans for the electromagnetic separation plant at Oak Ridge. In 1945 he served as a health safety advisor during the first atomic bomb test in New Mexico. In 1946 Dr. Aebersold became chief of the Isotopes Branch of the Manhattan District, U. S. Army Corps of Engineers. He is now Director of the Isotopes Division of the Atomic Energy Commission which supplies isotopes to hundreds of research institutions, universities and hospitals all over the world.

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Atomic Power—Mankind's Boon or Destruction?

Announcer:

Town Meeting tonight begins its annual fall and winter tour. We are broadcasting from the new senior high school auditorium in Rocky Mount, North Carolina. Our host is the Rocky Mount Chamber of Commerce and this is the first event to be held in this fine new auditorium, completed just a few days ago. Rocky Mount is the third largest bright-leaf tobacco market in the world. This area also is an important cotton market, and the program of balanced farming has made this part of North Carolina an increasingly valuable livestock area.

Founded in 1816 on a rocky mound on the banks of the Tar River, the city developed as a textile manufacturing and railroad center. The proximity of Rocky Mount to the seacoast and the mountains has made it a very desirable city in which to live. Its citizens are justly proud of its many fine churches, progressive organizations, and public facilities. Town Meeting salutes tonight's host city, Rocky Mount, North Carolina.

Now to preside as moderator for tonight's discussion, here is the well-known ABC Washington news reporter, Gunnar Back.

Moderator Back:

Thank you. Never before has the talk of the atomic bomb and the hydrogen bomb been so ominous. Our Secretary of State, John Foster Dulles, said, not so long ago, "Physical science has now made it possible to destroy life on this planet," and he paused as he added, "and I mean this literally." President Eisenhower shortly thereafter most solemnly declared in words like these: "No tax, no cost, no sacrifice is too great to protect this nation against weapons we now know have the power to destroy the face of the earth." We now begin to understand that atom bombs are a two-way matter. It is an idea we are beginning to live with more than we did before.

The potential enemy is quickly catching up with us, and who is to say may not surpass us? This is now so relentless a fact that we may well be at the moment standing at a complete change of national policy, with survival the principal issue. And so we debate tonight's Town Meeting question: "Atomic Power—Mankind's Boon or Destruction?" from this beautiful new senior high school auditorium in Rocky Mount, North Carolina, in the hope that you will better see what some of our genuine fears are and what hope we can find to put those fears down.

It is not only of destruction that we will be talking tonight, but also of the promise of the truly better world which atomic power is sure to bring one day if all goes well. Ironically, at the time of the greatest threat of destruction, the promise of atomic power to enrich peacetime begins to emerge also more clearly. So at the risk of being trite, we say atomic power has two faces. And to talk about the first of these, you will hear Dr. Ralph E. Lapp, Director of Nuclear Science Service, author of the book, *Must We Hide?* and a new volume out this year called *The New Force.*

Dr. Lapp, with degrees in physics from the University of Chicago,

worked on the wartime atomic bomb project from its inception. He participated at the Bikini bomb tests in the Pacific as a consultant on radiation. Later, in various capacities as a nuclear scientist, he was associated with the War Department General Staff, the office of the Secretary of Defense and the office of Naval Research. His much discussed article, *Operation Candor,* appears in the September issue of the *Reporter* magazine.

Dr. Lapp approaches the subject from the military, the political point of view, as well as the scientific. Dr. Paul Aebersold is eminently qualified to discuss the uses of atomic energy for peace time tonight. He is director of the Isotopes Division of the U. S. Atomic Energy Commission. I want to say more about Dr. Aebersold in a minute, but let's hear first from Dr. Ralph Lapp, speaking from Town Meeting in Rocky Mount, North Carolina, under the auspices of the Rocky Mount Chamber of Commerce on the subject: "Atomic Power—Mankind's Boon or Destruction?" Dr. Lapp.

Dr. Lapp:

As Gunnar Back has put it, the atom has two faces. I shall try to describe the military aspects of atomic energy. These loom large in the public view, especially now that the Soviets have the hydrogen bomb in addition to a variety of atomic weapons. Both scientists and laymen alike were amazed back in the summer of 1945 when the split atom put in its appearance. A bomb was created with the power of thousands of tons of TNT—twenty thousand to be precise.

Today, eight years later, this 1945 model A bomb is eclipsed by modern A bombs ten times more powerful and by hydrogen bombs over 100 times more potent. The punch of the H bomb is measured in a new unit called the *megaton,* and it means one million tons of TNT. For example, the H bomb we tested a year ago at Eniwetok packed a punch equal to a stack of TNT the size of the great pyramid of Cheops. Let me give you a kind of yardstick for sizing up the H bomb. Its power ranges from one to ten million tons of TNT. Translated to area of destruction, this means that the superbomb can knock out a city the size of Washington, D. C., right on up to a colossus like Philadelphia, Chicago, or Detroit.

This being true, and I assure you that it is, you need little imagination to see why these weapons revolutionize the basic concept of war. One hundred bombs dropped on one hundred U. S. cities would lash at one out of every three people in this nation. Not all would perish or even be injured, but one out of five would be killed or wounded. This means a total of some thirty-three million deaths or casualties, all from an attack which could come without warning and could take place within a few hours.

Such an attack could knock out the United States—knock it out before a war even began. This is not mere conjecture. It is the result of a hard-boiled, statistical analysis by scientists working under the auspices of the government. The United States today, in spite of these facts, is open to aggression; our defenses are practically non-existent. Yet defenses *can* be erected against the threat of both A and H bombs, but I do not believe that we will really do so until the American people are aroused from their deep sleep of complacency, and I hope to do a

little awakening tonight. *(Applause)*

Mr. Back: Thank you, Dr. Ralph Lapp. I, for one, am thoroughly wide awake now. Dr. Paul Aebersold is a University of California graduate, a research expert in nuclear physics, biophysics, and cancer. He was at the first atomic bomb test in New Mexico and he also worked on the Manhattan Project that brought out the first A bomb. He is now director of the Isotopes Division of the AEC working in Oak Ridge. I am sure you will be glad to know, Dr. Aebersold, that by special arrangement, what you say tonight will be heard over the air as will all of us in Oak Ridge. Now Dr. Aebersold, with his view on tonight's subject and an explanation of the meaning of the isotope. Dr. Aebersold.

Dr. Aebersold:

I am glad to see this keen interest in atomic energy in a town of around thirty-five thousand people, because that is about the size of Oak Ridge. There we eat and sleep atomic energy, but we don't believe the rest of the country has much appreciation. We certainly are glad to see the grass-roots interest in the discussion of problems of atomic energy. Now as Dr. Lapp can equally well tell you, there is a sunny side to the atom, and I would like to tell you some of it.

First, the same energy that can be released so suddenly, as an atomic explosion, can be released slowly and used to propel vessels, and trains, and produce electricity for homes and factories. Instead of the uncontrolled chain reaction of the bomb we can have a controlled chain reaction and produce useful energy. Our stockpile of atomic bombs thus is, at the same time, a tremendous storehouse of useful energy. About three-fourths of the money which we in this country spend on atomic energy is for research, development and production which cannot be said to have either purely military or peaceful use, but can be used for either.

I am associated with one phase of atomic energy which is definitely beneficial. This is the distribution of radioactive materials, or man-made atoms called radioisotopes. Most of the elements around us here are ordinarily stable, but we can take these atoms and make them radioactive by putting them in our atomic reactor such as we have at Oak Ridge. The war-time development of this atomic pile, a uranium chain reactor, has made it possible to make these man-made radioisotopes abundantly and cheaply.

We can put ordinary elements like phosphorus, or iron, or cobalt into the reactor, and they come out as radioactive phosphorus, radioactive iron, or radioactive cobalt. Now these radioactive atoms are the same chemical as the element that they were made from except they give off atomic radiations, and these radiations cannot be seen or heard directly, but they can be detected by an atomic instrument called a geiger counter, and these tiny amounts of radioactive elements can be added to a living plant or system and then traced wherever they go. You can trace a specific batch of atoms through a very complicated biological process.

This tracer atom technique is an extremely powerful tool of modern research and is a tremendous revolutionary step forward in our ability to ferret out the secrets of living and physical systems around us. Now the knowledge acquired through the use of

tracer atoms is already being used to improve the fertilizing of our crops, to improve animal nutrition and health, and it is being used to study human disease and health and also to obtain accurate knowledge of how our bodies function.

They also are being used successfully in diagnosing, in treating certain diseases, and by now many thousands of persons have been benefited. A great deal of investigation is being carried on with them to learn more about cancer. Analysis of many industrial processes by use of radioisotopes has led to improvements in manufacturing. These are peacetime products we can safely send around the world as a boon to mankind.

Atomic energy is thus a great new force which can bring us a better material world—less hunger, want, and disease, a better world in which to base better social and moral living. It can strengthen our sense of values and purpose. And armed with the faith that we were not put here to blow each other to bits, atomic energy can add substantially to our moral force and bring about peace and human betterment. *(Applause)*

Mr. Back: Thank you, Dr. Aebersold. Now we have heard the story of the destructive threat of the atomic bomb and the value of atomic energy and power for peace-time purposes. Dr. Lapp, do you care to comment on what you have just heard, the picture you have just heard of the energy as a boon?

Dr. Lapp: Well, I could comment in one sentence which would be a question. And it might be phrased rather flippantly — Is it boon or boom? I believe that is really the issue, because, if we are not allowed to have peace in this world, that is, unless these weapons can be put under control, I do not believe we will ever reach the stable condition where we can really use the peace-time aspects of atomic energy.

I feel very strongly about the matter that the American people must be fully informed as to what this real threat of atomic weapons is, because I think that many of them are going on the supposition that somebody in Washington is going to take care of defense against the atomic bomb, that somehow or other those people down in Washington are really going to take care of this thing. And believe me, they are just as befuddled as any man in the street.

Mr. Back: Now, Dr. Aebersold?

Dr. Aebersold: Well, being on the staff of the Commission, I am not able to give an official opinion, and even really to say anything that would be my personal opinion on matters of military or foreign policy with regard to atomic weapons for several reasons. One is, of course, that if I agree or disagree I might violate security, because agreeing or disagreeing one way or another might indicate something about weapons that Mr. Lapp mentioned. Also, until there has been some high-level policy discussed, it is very difficult for us in some of the lower levels in government agencies to really know what to say on the subject.

Dr. Lapp: I would like to interrupt, Dr. Aebersold, to come back to the first point you mentioned, because I think it strikes right at the root of the problem. If the officials—and you are certainly an official of the Atomic Energy Commission—are not allowed to tell the American people the facts, and, if in fact some of these officials—and

I am going to quote one of them who is, we'll say, one of your bosses, Commissioner Eugene Zuckert, who is an Atomic Energy Commissioner—if these people believe, and here is a quote from him, "We feel that by disclosing more information we would not be helping the American people as much as we would be helping a potential enemy."

He goes on to say that the American people have all the information they really need. This, I entirely disagree with. I believe that the first line of security of the American people is an informed American people, and unless we have some means of relaxing the security barriers which have not protected us, they have not prevented the Russians from getting the A bomb or the H bomb, I believe that the first prerequisite is that we have *candor.*

Mr. Back: Dr. Aebersold, the restrictions you just set up, do they limit you from having a personal view on the amount of candor we demonstrate?

Dr. Aebersold: No, I certainly agree that we should tell as much information as we can without helping the possible enemy in regard to actual secrets that would help them with their weapons program. Now that decision has to be made at a very high level, and it is a good thing, I think, that there are scientists who don't work for the government, so they can express their own personal opinions. Dr. Lapp used to work for the government, and he got out so that he could express his views just as he pleases. So he can answer most of these questions on weapons for us.

Mr. Back: Perhaps I can raise this question, Dr. Lapp. You say constantly that if the American people are told, things will be different. Does that mean that we will get more bombs? What does it mean?

Dr. Lapp: First of all, I would like, Mr. Back, to make one specification about what we want to tell the American people. We do not want to give out the information which would in any way hurt the security of the United States, in the sense that we want to tell how to make atomic bombs, so Junior can go and make one in the cellar. This can't be done, despite the wire services releases of the past week which would lead one to believe that H bombs can be made cheap—make them cheaper by the dozen I guess.

This is utterly fallacious, but it spells out my very point—that unless the Atomic Energy Commission substitutes some solid facts for the present supercharged abundance of bad information about atomic weapons, the poor American people just do not know what to believe. And I would like to spell out that there is really no barrier to telling the American people the facts, and there is at present, after eight years, there is at present a plan in Washington, D. C., for the President of the United States to speak to the American people in what is called Operation Candor.

Now I think this question, Mr. Back, that you raised there is, what do we expect for Operation Candor? Isn't that a fair question? This operation Candor which has now been in print for quite some time is scheduled to take place early next month, I believe within two weeks, when President Eisenhower will go on a television and radio hook-up to tell the American people the facts about life in the atomic age.

Just what this will accomplish

has led many people to be rather skeptical. They say, well the American people won't react. I believe they will. I believe that the real thing that will happen when President Eisenhower courageously addresses the American people and gives them the real facts about atomic and hydrogen weapons is that first of all . . .

Mr. Back: May I interrupt? Do you mean the number of atomic bombs we now have and an estimate of the number the Russians have? The actual number?

Dr. Lapp: I wouldn't say that it would be worth while, in fact I would not urge the exact number, but I believe that this can be done in relative terms to indicate something of the nature of the threat that we have. I would urge specifically that this concept of cheap H bombs, such as the Russians would have a hundred by next week, be dissipated.

I think that if a person will put authority behind the facts about atomic energy, that he would be doing the greatest service that has yet been done in the atomic age because authority is what we need. I go around the country and lecture and I try my level best to give the facts as I understand them, but this is at present a very weak-kneed substitute for the fact that the government must come out and *tell* the essential facts.

For example, I recently published something about the hydrogen bomb, and I specified what I thought and believed honestly to be the radii of action, that is the areas of damage from a hydrogen bomb. The very same day that I published this, a writer came out with areas of damage which were so great that six bombs would destroy the entire eastern seacoast. Well if the American people believe that six bombs will destroy the American seacoast, I think that we are in a pretty bad way.

Mr. Back: Thank you, Dr. Lapp. And now, Dr. Aebersold, what is your comment on that?

Dr. Aebersold: I agree that in a democracy we have to believe in the wisdom of the ordinary person, and I certainly think that that is what our whole existence as a nation has been built up on and our future depends upon it, because I think that gives us a resourcefulness and ingenuity that the dictatorships don't have. I believe that this is a thing that must be faced, and this Operation Candor that Mr. Lapp talks about would be based on this faith in the American people to know the facts and make their decisions on that basis.

Dr. Lapp: Well, it is really a faith in the old Town Hall Meeting, isn't it?

Mr. Back: I was just wondering whether I ought to ask just one question before we go to the listener question of this week. What have you arrived at, both of you, as probably the only solution in the end to the handling of the H bomb and the A bomb so that the destructive quality can be controlled and we can go ahead on its boon-like quality? What would you say, Dr. Lapp?

Dr. Lapp: Well, I think that I can answer that, and perhaps even give some optimism to the military aspect of this weapon, because I believe that if the facts are made known, the existence of atomic and hydrogen bombs must necessarily spell an end to war on the planet, because people would be out of their mind to go into a war in which such weapons were used because no one would win it. Now I do not mean that we should put

unlimited faith in the concept that we will not have an atomic war, because we can, and the fact that we are not prepared is an invitation to destruction. But I believe that *perhaps* if not World War III, that World War IV would be averted by the fact that these weapons were so demonstratively destructive.

Mr. Back: Thank you. Dr. Aebersold?

Dr. Aebersold: I believe it is the historic policy of the United States to be as well armed as it possibly can. I think we should continue that policy. I don't think there is any other alternative than our development of A bombs or H bombs. However the point I am making is, that we can't become so preoccupied with weapons that we don't realize that this is also a great new force for betterment, because if we can avoid war we will have great developments from atomic energy which can help raise the standard of living around the world. I believe that we should pursue at the same time very fundamental basic research, aimed for the future. If we don't have fundamental research going on today, and a big program in it, we may miss some of the developments of tomorrow. Only a few years back, the A bomb and the H bomb were fundamental research. Only by having very strong programs of research and development in this country will we be a strong nation five or ten years hence.

Dr. Lapp: I would like to point out one of the very cheeriest aspects of atomic energy. This summer we had hearings in Washington, D. C. (You know, we have a lot of hearings down there.), but these hearings were addressed to atomic power development. The Congress, at least one of the congressional committees, was considering the development of this new force for peaceful uses. This hearing took place as a result of the fact that there had been technical developments, which mean that we are now able to use power from the atom.

Within a relatively few months the navy will be putting to sea the *USS Nautilus,* an atomic submarine, which will drive the submarine below the surface of the water at speeds greater than 20 knots and drive it all the way across the ocean and back again without surfacing. This same type of motor, if suitably revised, could be used to drive a surface ship and if we do the work and make a more elaborate machine we can use this to generate electricity. We hope to produce cheaper electricity than is now being used. This, I think, is the great revolution which atomic power can bring to the world, because cheap power is the key to industrialization.

When I think that in India, for example, there is less electrical power than we use at one of our atomic installations, just think of that, when I think of this fact that we could give to India and to other power-deficient nations such atomic electricity, I think of a true revolution.

Mr. Back: Thank you, Dr. Lapp. I think we can ask the listener's question now; it falls right into that field. Each week we invite our listeners to submit a question which they would like to hear our speakers discuss on the air and this week Robert D. Wentworth of Alfred, New York, will receive a complete 20-volume set of the American People's Encyclopedia for submitting his question. And here it is: "What civilian uses are

being, or can be, made of atomic power without endangering military security?" And let me address that first to Dr. Aebersold.

Dr. Aebersold: Dr. Lapp has almost answered that already, has pointed out that power has been produced by solar reactors already. The Atomic Energy Commission has several reactors at Idaho Testing Station which have produced power. There is one at Oak Ridge that has produced power. So it is technically feasible *now* to produce electrical power. The only question is that of economics, producing cheaper power, and that will come with time and development and I believe that it will take a combination of both private and government enterprise over a period of time to develop this great new power.

Mr. Back: Dr. Lapp?

Dr. Lapp: Mr. Back, I would like to say that I think this atomic power development must be accelerated in this country. The fact that we have some reactors, the fact that we have some machines that will be driving submarines, does not mean that we have peace-time power. These are quite different machines. At the present time, it is rather unbelievable that in the United States there is not one single large-scale peace-time reactor under construction. Now we have in Britain, for example, such a reactor under construction scheduled to be in operation in two to three years, and heaven knows what is going on behind the Iron Curtain. But I would judge that the Soviets will get atomic power, that is in terms of atomic electrical power, before we do. Then they will hurl the propaganda charge that Uncle Sam is nothing but an atomic munitions maker. I think we have to be the first to get atomic power, and I hope that we can accelerate our program.

Mr. Back: Thank you, Dr. Lapp. I think we will go to the audience now for some questions from Rocky Mount in North Carolina. I believe the first question is addressed to you, Dr. Aebersold. May we have the question?

QUESTIONS, PLEASE!

Questioner: I would like to know how atomic power will affect the future automobile.

Dr. Aebersold: Well, it won't affect it directly, because an atomic reactor is too large to put into an automobile. But some of the research that is being done on radioisotopes, if I can come back to those, is being done to improve lubricants and friction and so on, because you can make a piston ring radioactive and with it you can study the wear of an engine. This has greatly accelerated the study of all kinds of engines and parts of machines, but I don't think you will run the automobile by atomic energy for quite some time.

Dr. Lapp: You mean you've got hot rings?

Mr. Back: A question for Dr. Lapp, I think is next.

Questioner: I have heard that it has been suggested that we might be able to buy an automobile a few years from now with a package some three inches square. Perhaps it might operate the vehicle for its

entire life. I just wonder if you go along with that possibility.

Dr. Lapp: No, I don't. I think you can go ahead and buy your new automobile at the present time. *(laughter)*

Mr. Back: All right, a question for Dr. Lapp from the audience.

Questioner: I think we have learned a lot about the Soviet in the last year, especially during the Korean War. They were lying to us about a lot of the claims that they say. Now I want to ask you as an expert, do you know of a surety that the Soviet has the H bomb?

Dr. Lapp: Do we know that the Soviet has the H bomb? The information which the American people have been given which first came from Mr. Malenkov, and he said that the Soviets would have a hydrogen bomb capability. Then the next thing that came out after much speculation in the American press, and much doubting, was the fact that the Soviets then announced that they had tested an H bomb. Within 24 hours, the Atomic Energy Commission, in a statement of some two sentences, said that the Russians had detonated a thermo-nuclear device, which is gobbledegook for H bomb. This is what has been officially said.

I have not had access to the cloud data, the radioactive data from the hydrogen bomb cloud, which would have been wafted outside the Iron Curtain, but I would say this it is certainly technically possible to determine whether or not the Russians have exploded a very large bomb. I would assume that it is possible to determine whether that was an atomic bomb or a hydrogen bomb and I would assume that it is part of the responsibility of the President to inform the American people when such weapons are in the world.

Mr. Back: In other words you are saying *yes.*

Dr. Lapp: Yes. Coming from Washington, I couldn't say it that quickly.

Questioner: Dr. Aebersold, under the present law, government produced hydro-electricity is made available first to non-profit groups such as cities, public utility districts, and electrical cooperatives. My question is this: In the event the government does produce electric power through atomic energy, is it your opinion that the sale of that power should be made on the same principle as already affects the sale of hydro-electric energy produced by the government?

Dr. Aebersold: Well, I think that is a decision to be made by the American public and made by Congress. After all these hearings, when all parties present their opinions on the role of private enterprise, and how much they are prepared to put up with their own capital, and the present status of the technology, I think that Congress will change the Atomic Energy Act so that the things that the public wants will take place, and in the long run there will be a very great private power industry from the atom.

Mr. Back: Thank you, Dr. Aebersold. A question now from the floor for Dr. Lapp.

Questioner: Dr. Lapp, you said our defense against atomic attack is very weak. We all know that defense costs money. Do you think the danger is so great that the Administration should forget about the income tax reduction and put the money into adequate defense?

Do you think the people will go along without a tax reduction?

Dr. Lapp: The answer to the first question, do I personally think that we should go without the tax relief is, yes I do. I think that we *must* have defense against these weapons and that no cost is too great, because the cost of not having defense may be eventual subjugation. Secondly, it is much more difficult to answer whether or not the American people will go along. It is a question of television sets and automobiles rather than tanks and planes. I would say planes because I think the emphasis in atomic defense has to be on air power and not on ground power.

But as to whether or not the American people are willing to go along with that, I think depends upon the information they get and the reliability of it. I think that this is going to be the key question that will come out of Operation Candor, because once the President puts this issue on the line I think there will be a spontaneous reaction from the American people—a chain reaction that will run through every state in the Union. There will be a funneling back of the information to the President, saying that if there is defense against these weapons, we will pay for it.

Mr. Back: Dr. Lapp, may I come in for a moment? When the American people have been told, what are they likely to ask for? Are they going to say, we are lacking in defenses of our shores, we need more airplanes? Will they be in a position to decide where this money should go?

Dr. Lapp: I think I have some very good news for the American people. The scientists have been thinking about this problem of atomic defense for some time. They have been gravely worried about it, because they know that the United States is vulnerable and they know that perhaps as early as next year, certainly no later than two years, the Russians will have the capability of destroying the United States, and it is very dreadful to think what that will mean to us. Think of the psychology of fatality that will permeate the United States when that becomes apparent to the American people.

But scientists, in what is known as Project Lincoln, can analyze the possibility of making an air defense shield extending right up into the Arctic to shoot down the enemy bombers, using entirely new developments, a new type of radar, using new communications systems that work during electromagnetic storms in the Arctic and using new interception devices—using atomic bombs to shoot down enemy bombers. They believe it is possible to actually prevent the United States from being knocked out by enemy attack.

Mr. Back: Thank you very much. I took a bit of time from the audience, so back to the floor.

Questioner: Dr. Aebersold, if and when atomic energy becomes a complete reality, what would be its possibilities and proximities of usage in relation to electrical power?

Dr. Aebersold: Well, atomic energy can produce electrical power; it already has been demonstrated with some of the reactors. As I mentioned earlier, I think its technical problems are being solved rapidly. The problems of economics are still to be solved and that, of course, will come with time, because quite a few reactors will have to be built of different

types and tested before one can find out which is the cheapest way to make power.

Mr. Back: A lot of people are still waiting to ask questions, so here is one for Dr. Lapp.

Questioner: Dr. Lapp, would you be in favor of sharing atomic secrets with our allies in western Europe, including West Germany?

Dr. Lapp: Would I be in favor of sharing the atomic secrets? Certainly. In fact one of the most compelling reasons comes from a newspaper clipping which I just happen to have in front of me. It is by Marshal Alphonse-Pierre Juin, Commander in Chief of all North Atlantic Treaty forces in the strategic sector of Western Europe. He publicly urged the United States Government to release sufficient information on atomic weapons to allow non-American allied commanders to do their job efficiently. Now isn't this a really sad state of affairs, when we don't even allow the people we are fighting with to know about the weapons that they are going to have to fight with? This really becomes almost a laughable situation.

Mr. Back: Thank you. The next question is from this young lady.

Questioner: I would like to direct my question to Dr. Aebersold. Do you think there is a possibility of atomic energy being made available so that it will benefit mankind for use in peaceful pursuits?

Dr. Aebersold: Well, as I pointed out, isotopes are produced by atomic energy, and thousands of shipments have been sent all over the United States, all over the world. Hundreds of researchers use them in science, medicine, agriculture and industry, so that there is already a large peace-time utilization of atomic energy, and power utilization is also coming along rapidly.

Mr. Back: Dr. Lapp, do you want to comment on that?

Dr. Lapp: Dr. Aebersold, isn't it true that they are being used in the tobacco industry?

Dr. Aebersold: That's right, I should mention this. Over at North Carolina State College, they are doing a great deal of work on the use of radioactive fertilizers to study the best way to fertilize various kinds of crops, and of course one of the crops of interest here in North Carolina, I understand, is tobacco. They are studying the best way to put the fertilizer in the tobacco fields to increase the yield, and they have found a great deal of useful information on that already.

I should also like to mention that we appropriately had this meeting here in North Carolina because over at Raleigh they have the first privately built reactor. North Carolina State has a reactor that they built with their own money entirely. The only thing that is furnished is the uranium in it. That had to be furnished by the Government according to the Atomic Energy Act at present, but it is a privately built reactor. I think there lies a great deal of future—this training of the college students as they come along because that is the key to future developments.

Mr. Back: Thank you, Dr. Aebersold. Wonderful questions and wonderful answers. One thing, I think when the last question was asked Dr. Lapp, I think the concern of the person who asked it was this: If you were to give the secret to the West Germans, what would

keep the secret from passing over into East Germany?

Dr. Lapp: Well, first of all these things are not really secrets, and that is why I advocate giving away. We are just pretending they are secrets, and this is why the whole situation is so laughable, because all I am talking about is what these weapons do. We have all sizes of weapons, from weapons which destroy one square mile up to weapons which destroy over a hundred square miles.

By telling our allied commanders the types of destruction from these weapons, we allow them to plan what they call their tactical defense. We hope to use—and I would say this, we hope we never have to use—but in case the Red army is unleashed and tries to roll across Europe, it is the hope of the NATO chiefs that they can lay down a barrage of atomic bombs and impede the progress of the Red army with these weapons.

Mr. Back: Thank you, and now to the floor again.

Questioner: Dr. Lapp, do you think the Bricker amendment to the Constitution to restrict the treaty making power of the President and the Senate would make more difficult the participation of the United States in ratification of the Baruch or any other plan for control of atomic energy and the amendment of the United Nations Charter to strengthen it?

Dr. Lapp: Yes, I think that is a very good question and I think that it would. I think, and I am not being facetious, but I think that one of the things we might have to fear at the present time is that the Russians would jump at the chance to have international control for the very reason that there are some people in the Senate who would resist any attempt

to have international agreement, and therefore the Russians would really have a propaganda coup.

Mr. Back: Thank you, and the next question is for Dr. Aebersold.

Questioner: What is the possibility of electric power generated by actual nuclear fission in the near future?

Dr. Aebersold: That is a good question. However, at present the only road to useful power is through steam. Atomic energy will be used to create heat, and the heat to create steam, and then go through a turbo generator. At present there is no other easy road to atomic power than that.

Mr. Back: We are glad to get these questions from students, so let's have yours.

Questioner: Dr. Lapp, how will the United States build an atomic treaty to fit the United States as a peaceful nation?

Dr. Lapp: I think that is a very difficult question to answer. For a person so young, you ask a very difficult question. I think that the problem of international relations with respect to atomic energy is one of the most important in this atomic age, because first of all we must have allies. We need allies not only before war but we need them during the war, and in connection with before war we use them because we ourselves do not have enough of this atomic material—uranium. We have to get it from South Africa, from Australia, from the Belgian Congo. So it is important to have good relations with our allies.

Mr. Back: I think we have time for one more question.

Questioner: My question is addressed to Dr. Aebersold. Do you think our major hydro-electric power projects will be run by atomic energy, and if so, how

Dr. Aebersold: That is one that ou can't answer in 10 seconds, but will be several years before there ill be a real prototype and then will take quite a few years fter that before there will be any rge number of plants in opera- on. Some people say 10, some y 20 years.

Mr. Back: Thank you, Dr. Lapp nd Dr. Aebersold, for your most nformative discussion. Our thanks to Mr. Jasper L. Cummings, President, and Mr. R. Graham Dozier and Mr. James N. Wilgus of the Rocky Mount Chamber of Commerce, and to Mr. W. Avera Wynne and his staff at Station WEED for their fine co-operation. Our appreciation also to Town Meeting's regular Tuesday night sponsor in Rocky Mount, the People's Bank and Trust Company.

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OR FURTHER STUDY OF THIS WEEK'S TOPIC

Background Questions

TOMIC POWER—PEACEFUL USES

1. How much current atomic research is purely for peaceful purposes? How much military atomic development can be directed into peaceful, constructive channels?
2. What are the prospects for the utilization of atomic power in industry and homes? Can this power be harnessed to propel vessels, planes and other vehicles?
3. Describe the use of radioactive isotopes in medical science, biological and chemical research, agriculture and industry?
   a. How have radioactive isotopes been utilized in diagnosing and curing diseases?
   b. Will radioactive materials and technology revolutionize our industry?
   c. Can we envision a greatly expanded food supply as a result of work with radioactive tracers, examining the efficiency of fertilizers, studying photosynthesis and animal husbandry?

TOMIC POWER — MILITARY POTENTIAL

1. Has the advent of atomic weapons radically changed tactical and strategic concepts of modern warfare? If so, in what way? Have any of these changes been illustrated by the Korean conflict?
2. Where is the U. S. in the atomic race? Have we a significant lead? Can we estimate the extent of Soviet atomic development?
3. Is the time approaching when being ahead in the race to stockpile atom bombs will become relatively unimportant?
4. Have we reached the point where delivery of the bomb and defense against it have assumed greater military relevance than supremacy in atomic munitions?

TOMIC POWER — MILITARY AND CIVILIAN DEFENSE

1. Is the contention that there is no defense against atomic attack correct?
2. Is "offense the best defense" in atomic warfare? Or, must we operate on the assumption that the U. S. S. R. will start the third world war and will deliver the first atomic attack?
3. Have we an adequate interceptor force to combat Soviet long-range bombers? How much protection can this type of operation afford?
4. Can we devise our military defense plan as a single nation? Or

must an adequate defense encompass the North American continent? The entire Western world?

ATOMIC SECRECY

1. Is the subject of atomic energy and policy too technical for the layman to understand?
2. Have we tended to equate secrecy with security in our atomic policy? If so, is this equation correct?
3. Is all atomic secrecy in the national interest? Have we kept things from the American people that they should know and that the Russians already know?
4. Has atomic secrecy hampered or helped the development of atomic power for both military and non-military purposes?

ATOMIC POWER AND UNITED STATES FOREIGN POLICY

1. Is it sufficient policy just to try and keep ahead in the race for stockpiles of atomic weapons?
2. Have we fully comprehended and evaluated all of the social, economic and political problems atomic energy has created?
3. Must we devise an over-all nuclear strategy, clearly related to our policy objectives and diplomatic strategy?
4. Will atomic defense measures require reversal of our present policy of trimming defense expenditures?

INTERNATIONAL CONTROL OF ATOMIC POWER

1. Must international control of atomic energy be part of an over-all disarmament program?
2. What are the outstanding differences between the U. S. and U. S. S. R. on such a disarmament program? Can these differences be resolved?
3. What are the prospects for an adequate inspection system ever being devised? Is inspection enough? Or, is international ownership of all atomic resources, plants, etc., the only true safeguard against atomic aggression?

ERRATA

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Father Hartnett: Well, I would like to ask Mr. Heckscher a question. He talks about people limiting our freedom by having an ax to grind. Well, first of all I think an awful lot of people have an ax to grind, but haven't all secular newspapers as capitalistic commercial enterprises an ax to grind when dealing, let's say, with public issues such as taxes or labor disputes? Aren't they to some extent parties to the argument?

Mr. Heckscher: Well, all I can say is, we do our very best to be objective and detached in setting forth the news. A judge, for example, in trying to interpret the law, let's say a law like the income tax originally, he has his private interests, his private life. He has to pay taxes. But he does his best out of his professional ethics and out of his qualities of judgment to rise above those interests. We try to rise above them every day.